

YOR9-2001-0335  
Amendment dated 01/22/2007

09/917,818

00280706aa  
Reply to office action mailed 10/20/2006

### **REMARKS**

Claims 1-11 are currently pending in the application. The foregoing separate sheets marked as "Listing of Claims" show all the claims in the application, with an indication of the current status of each .

Proposed drawing corrections were submitted on January 28, 2003, but the Examiner has given no indication whether these proposed drawing corrections have been approved. Such an indication is respectfully requested.

The Examiner's reopening of the prosecution, and indication of allowable subject matter, is acknowledged with appreciation.

The Examiner has rejected the claims under 35 U.S.C. §101 on the ground that the claims merely disclose a mathematical algorithm without producing a useful, concrete or tangible result. The Examiner has indicated that claims 1-3 would be allowable if claim 1 is amended to include a limitation in the body of the claim that provides a tangible result.

By way of background it will be helpful to describe the auction environment within which the invention provides a needed solution, and then to briefly highlight the methodology of the invention.

The claimed invention is directed to an improved computer implemented method for selecting bids in a reverse combinatorial auction. The method according to the invention automatically selects the optimal bid when commodities are offered in bundles by automatically generating an algorithm which may be implemented on a computer for solving the cost-minimization problem. The auction is run as a procurement auction, where the buyer (e.g., a manufacturer) wishes to purchase different items of varying quantities for the cheapest overall price. The total quantity of each item is referred to as a lot and is treated as an indivisible unit of some weight. Suppliers can bid on combinations of items; however, a bid on any item has to be for the entire lot for that item. The present invention identifies the optimal solution to the

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so-called winner determination problem for a single-unit reverse combinatorial auction by selecting a winning set of bids such that each item is included in at least one winning bid. As a result, the total cost of procurement is minimized. This problem is a set covering problem, which is known to be NP-hard. NP-hard problems are problems that are difficult to solve and the amount of effort (in terms of the time required on a computer) increases exponentially as the size of the problem (such as number of bids) increases. For example, if the number of bids goes from 100 to 200, then the time required to solve the problem might go from 10 seconds to 100 seconds (not 20 seconds).

The claimed invention provides an algorithm for identifying a cost-minimizing bid set in a reverse combinatorial auction subject to various business rules for all-or-nothing bundled bids, and second by providing a method for automatically generating this algorithm in a form that can be used with commercial Linear Programming/Integer Programming (LP/IP) solvers. In accordance with the invention, a computer-implemented formulation is generated by populating a set of matrices. Since the matrix is generally sparse, it is represented in a sparse form by providing only the non-zero terms. This is done by specifying a large array of non-zeros indexed by an integer array that indexes the row number for each non-zero entry. Additionally, two column vectors are specified that indicate the column index for the non-zero entry. These arrays are automatically generated, and the matrices are then automatically generated based on the formulation of the present invention.

The result of the claimed method is selection of a cost-minimizing set of bids covering the items bundled in the auction as winner. This selection of an optimal bid set is a practical and tangible result, enabling the buyer to optimally allocate the desired items to the selected bids and respective bidders. The independent claims 1 and 4 have been modified to add this selection result as an element. It is therefore believed that the Examiner's §101 ground of rejection has been overcome. There

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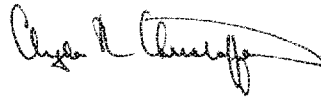
being no further outstanding grounds of rejection, it is submitted that the case is in allowable form.

In view of the foregoing, it is requested that the application be reconsidered, that claims 1-11 be allowed, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at 703-787-9400 (fax: 703-787-7557; email: clyde@wcc-ip.com) to discuss any other changes deemed necessary in a telephonic or personal interview.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Deposit Account 50-0510 (IBM-Yorktown).

Sincerely,

A handwritten signature in black ink, appearing to read "Clyde R. Christofferson", with a long, sweeping horizontal stroke extending to the right.

Clyde R Christofferson  
Reg. No. 34,138

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